Albert W Lewis
Director, Information Resource Management

Message from the Director

On July 15, 2002, Department of Energy (DOE) Secretary Spencer Abraham announced a major mission realignment for the Idaho National Engineering and Environmental Laboratory (INEEL). The new alignment establishes the INEEL as the nation's leading center for nuclear energy research and development. This mission realignment placed the facility under DOE's Office of Nuclear Energy (NE), Science, and Technology. Along with this new thrust the INEEL will continue environmental cleanup under the Idaho Completion Project (ICP), a newly organized entity responsible for facility and personnel consolidation, footprint reduction, and accelerated cleanup for DOE's Office of Environmental Management. Performing nuclear research while accelerating cleanup will require the availability and use of state-of-the-art information technologies.

In President Bush's Management Agenda, he has called for a government that is active, focuses on priorities, and performs work efficiently and effectively. To that end, his e-government strategy mandates increased use of the Web, information sharing, adoption of streamlined processes and commercial best practices, and using an enterprise architecture that describes how organizations perform work utilizing personnel, business processes, data, and technology. In support of this emphasis, information technology will be integrated into processes to deliver innovative solutions that further DOE's missions in energy, science, and defense.

Strategies outlined in this plan sustain the INEEL and ICP environment as a unified and integrated infrastructure (see Figure 1). The *Information Technology Strategic Plan* supports the strategies and philosophies set forth in the *INEEL Strategic Plan* and *Environmental Management Accelerated Cleanup Project Plan,* focusing information technology efforts on INEEL priorities while emphasizing areas of critical importance to ICP and other customers.

We look forward to partnerships that enhance our scientific, engineering, and business computing infrastructure. This infrastructure provides the tools necessary to demonstrate that the INEEL is the "home of science and engineering solutions."

Vision

Information technology enables INEEL and ICP programs to deliver science and engineered solutions to the world's environmental, energy, and security challenges by:

- *Providing solutions driven by mission needs*
- *Providing the ability to use information technology in work processes to gain efficiencies of service*
- *Prioritizing and managing information technology investments as strategic assets*

Mission

Information technology's primary mission is to enable INEEL and ICP mission accomplishment and operational excellence by partnering with projects for effective management and use of information technology.

Information Technology Roles

Work processes require information exchange, collection, analysis, tracking, documentation, simulation, modeling, collaboration, and information management. Information technology provides the tools to perform daily tasks in research, development, and operations as well as the underlying infrastructure for communications, data storage, manipulation, and transactions. Table 1 details specific information technology roles and responsibilities.

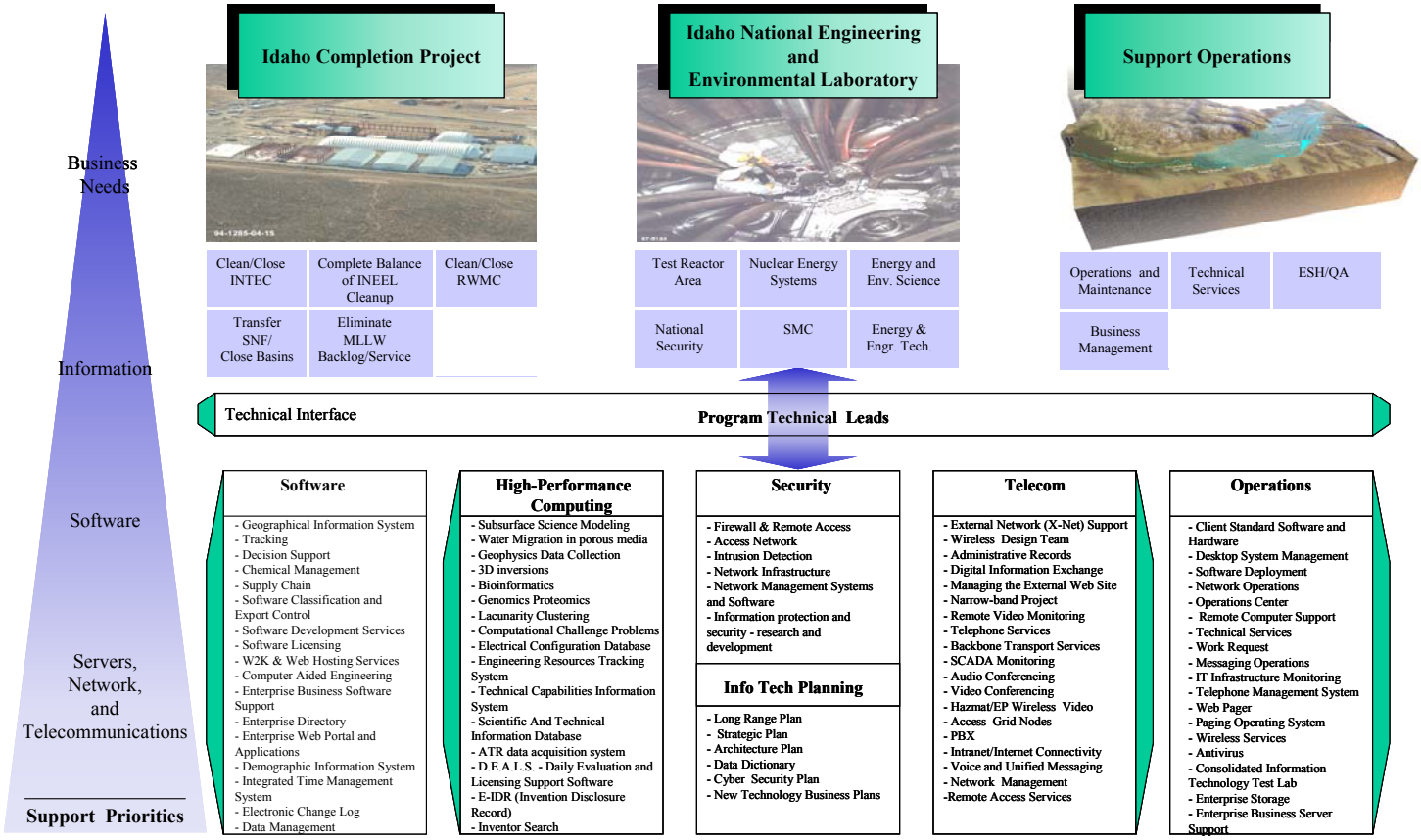


Figure 1. Information technology supports INEEL and ICP missions.

- Develop, test, demonstrate, and deploy advanced computing for all aspects of modern scientific/engineering research.
- Develop and deploy advanced computer and network technology to improve work processes for the INEEL, DOE, other security-related government agencies, and industrial customers.
- Develop and deploy software to scientific, engineering, and business customers.
- Provide life-cycle support for enterprise-class servers, including requirements gathering, design, testing, implementation, maintenance, operations, optimization, and decommissioning.
- Maintain a balanced enterprise architecture, data management, and information technology planning program.
- Manage information and technology assets by providing tools and processes that minimize redundancy while maximizing interoperability, maintainability, and stability.
- Provide telecommunications infrastructure to support voice, video, wireless, and data services.
- Perform system integration, design, installation, maintenance, and management of electronic systems, structures, and components.
- Operate a consolidated information technology operations center as a single point of contact for all information technology requests.
- Delivery cyber security solutions to support business objectives while ensuring prevention of malicious and inadvertent network disruptions.

Table 1. Information technology roles and responsibilities

Customer Satisfaction Guiding Principles

To ensure customer satisfaction and alignment with missions, information technology decisions are driven by six guiding principles:

1. Business needs drive information technology products and services.

Information technology product and service decisions are made in conjunction with INEEL, ICP, and external customers. Anyone within the laboratory using, providing services or products for, or affected by information technology is represented.

2. Customer productivity needs determine the level of information technology products and services.

Information technology is a tool to manage, assist, and enhance job functions. Working with all organizations provides comprehensive input for technology selections that optimize employee performance.

3. Information technology must be functional and adaptable.

An expanded, cost-effective, and well-supported infrastructure for scientific, engineering, and business computing must be flexible enough to enable rapid adjustment to new strategies. Investments in information technology infrastructure (machines, connectivity, support, and training) will maximize economies of scale, promote information sharing and collaboration, and reduce resource demands on distributed units.

4. Collaboration facilitates research leading to scientific breakthroughs.

Information technology will provide the scientific community with new opportunities for collaboration and distributed discovery without regard to location through partnerships with other laboratories, universities, and businesses nationally and globally.

5. Managing information technology investments encompasses the entire information technology life cycle.

Information technology activities are prioritized by business value and risk. The capital planning and investment control process is followed to select, control, and evaluate investments. Developing business cases addresses the full information technology portfolio management life cycle through conceptual planning, implementation, operation, and disposition of technology investments.

6. Secure computing is fundamental to information technology success.

Security is designed into all information technology elements, balancing accessibility and ease of use with protection of data and services. Information is made available based on risk to the government and business partners, federal laws, and an individual's need to know.

Challenges We Face

Information technology consists of the tools, resources, and computing capability for the INEEL and ICP to meet future challenges.

Enabling and Expanding Information Technology Infrastructure

Conducting radioactive waste cleanup, long-term stewardship, nuclear energy research, subsurface science, critical infrastructure protection, and scientific discovery requires ever-increasing computing capability, including the capacity to model, simulate, and analyze complex physical, chemical, and biological phenomena.

Expanded mission responsibilities in support of NE are anticipated in advanced nuclear energy systems, advanced fuel-cycle research, and support of the NE/NASA space nuclear program. Additional contributions are also anticipated in homeland security/national defense, hydrogen production and infrastructure, and biomass/whole-crop utilization.

The INEEL requires substantial investment in high-performance scientific computing and connectivity to enable successful fulfillment of these mission-critical responsibilities. It has become increasingly challenging to maintain the current telecommunications network backbone, which has exceeded its life expectancy, while demand for infrastructure services continues to rise.

Infrastructure investments will be balanced with investments in emerging technologies such as wearable computers, personal digital assistants (PDA), embedded computers, voice recognition, visual perception and technology tools to enable research and operations activities.

Enhancing Collaborative Environments

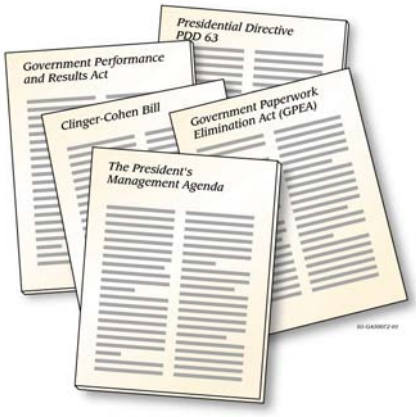
Collaboration is central to advancing scientific inquiry within all the DOE program lines: National Security, Energy, Environmental Quality, and Science. The INEEL's renewed focus on nuclear energy R&D will require greater emphasis on national and international collaborations. A computing and collaboration infrastructure must be in place that will enable a fluid exchange of ideas and conceptual designs between domestic and foreign team members. Easy accessibility to people from academia, industry, and government will enable the INEEL to form better collaborative teams.

Providing Continuing Security

As the premier nuclear engineering research facility, the INEEL faces the prospect of interference by terrorists and antinuclear activists. On an average workday, INEEL networks weather thousands of attempts to corrupt data streams, perimeter defenses, and Web content, and to obtain unauthorized privileges on our hosts. We must prevent such malicious and inadvertent cyber security disruptions.

Achieving the President's Vision of E-Government

The President's Management Agenda and focus on e-government presents many challenges in creating optimal environments for government-to-government, government-to-business, government-to-citizen, and



government-to-employee relationships while ensuring data integrity and security. In addition, we

must comply with a number of regulations mandating how we perform information technology-related business. These regulations include the Government Paperwork Elimination Act, the Information Technology Management Reform Act (Clinger-Cohen Act, 1996), the Government Performance and Results Act, Presidential Directive 63, Section 508 of the Rehabilitation Act Amendments of 1998, and the Government Information Security Reform Act of 2001.

Goals, Strategies, and Strategic Indicators

As a multiprogram national laboratory, the INEEL and ICP conduct science, technology, engineering, and program operations for DOE and other federal agency customers. Information technologies facilitate these operations (see Figure 2), enabling high-performance computing capacity, efficiency, and security.

Key to effective information technology are goals aligned with the INEEL and ICP strategic goals as well as with the President's Management Agenda. Information technology has four such goals, each with supporting strategies and strategic indicators, designed to advance INEEL and ICP missions:

Goal 1 – Support specific mission and program needs with required information technology.

Goal 2 – Provide an information technology infrastructure that is interoperable, available, and secure.

Goal 3 – Satisfy customers through responsive services by a cross-organizational pool of skilled professionals.

Goal 4 – Maximize information technology investments.

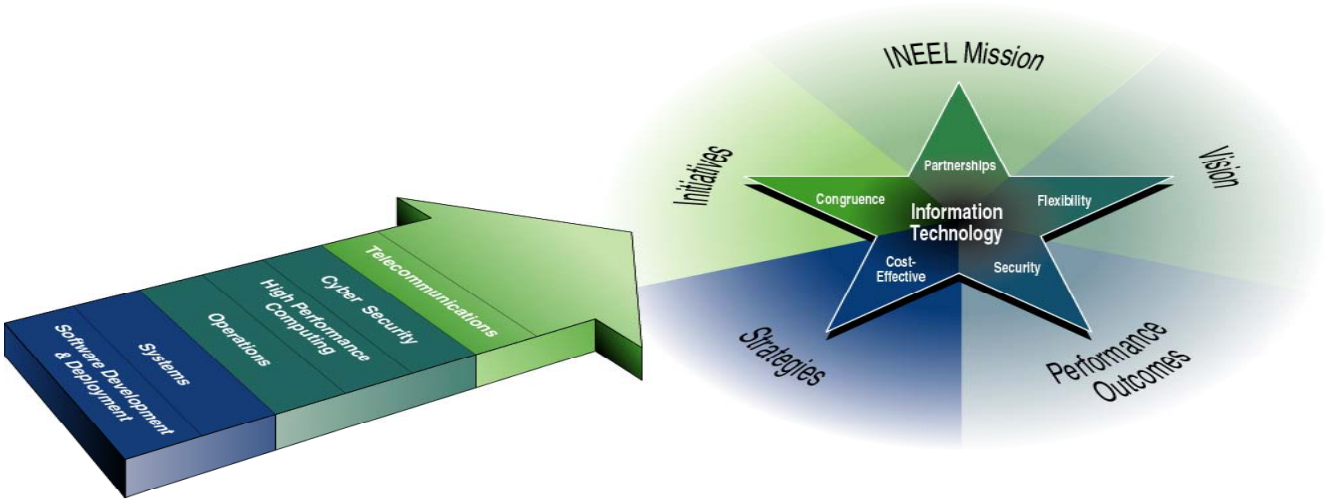


Figure 2. This plan strategically focuses our efforts on INEEL mission priorities while maintaining support in areas of critical importance to DOE and other customers.

GOAL 1 - Support specific mission and program needs with required information technology

To support the INEEL and ICP mission needs, we will work with program leadership to provide required technology for specific project requirements as well as to enhance the common infrastructure used by all projects (see Figure 3). We will apply our expertise in analysis, design, and development to provide projects with integrated, cost-effective, and efficient technology solutions to ensure improved operations, research, and development (see Figure 4). Information technology planning and enterprise architecture act as the integrating force between aspects of business planning such as goals, visions, strategies, and governance principles. Implementation is performed through a strong information technology project management discipline with solid software quality assurance support.

Information technology project support spans all business and technical management functions encompassed within the INEEL and ICP. Functions include integrated planning and assessment, supply chain, business management, communications, worker safety and health, intellectual property and technology commercialization, emergency management, facility management, support services, environmental support, programmatic work integration, human resources, project and work execution, information management, safeguards and security, and quality assurance.

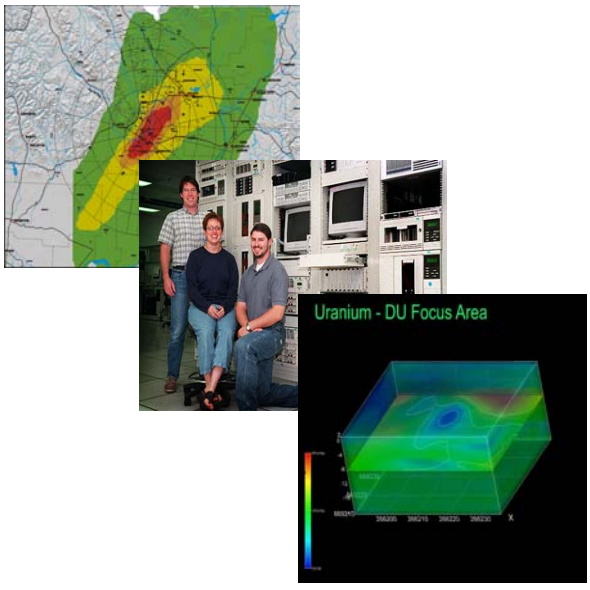


Figure 3. Information technology resources and applications provide customized solutions to accomplish mission needs.

Strategy

Provide research, development, and operations with innovative technical solutions.

Conducting basic and applied research and operations requires expertise, skills, and application of the right resources. Access to the right information technology resources can improve all phases of research. We commit to enhancing current capabilities through innovative application of technology resources. In addition, as a multiprogram national laboratory we will continue to excel in technological advances through exploration and appropriate application of emerging technologies.

Strategic Indicators

- Assign technology automation leads to critical programs and projects starting in 2003.
- Guide project decision-makers on the future directions of information technologies and the potential applications of those technologies.
- Demonstrate emerging information technologies through semiannual technology reviews and forums beginning in 2004.
- Demonstrate expertise in parallel processing, data visualization, large-system management, and numerical and statistical methods by 2006.

Figure 4. This information technology test lab assists projects in deploying technologies.

GOAL 2 - Provide an information technology infrastructure that is interoperable, available, and secure

Information technology operations focus on three major objectives: (1) a robust infrastructure, (2) system availability, and (3) secure exchange and storage of data. In meeting each objective, a cross-discipline, cross-functional approach is used with results measured using "best-in-class" industry metrics as the expected performance. It is imperative that information technology operations and services be delivered efficiently and effectively to enable mission accomplishment.

Strategy

Aggressively upgrade, integrate, and expand the computing infrastructure.

With the shift in our mission priorities from waste cleanup to nuclear energy research and development, there is a greater need for high-performance computing to model, simulate, and analyze complex physical, chemical, and biological phenomena.

High-performance computing is fundamental for conducting research in energy and environmental phenomena and for systems too complex to be accurately and timely modeled on personal computers and workstations. Continuing new programs in advanced nuclear energy systems, advanced fuel-cycle systems, critical infrastructure protection, and subsurface science will require state-of-the-art computing resources for data transfer, collaboration with international and national partners, data storage, and data manipulation.

Strategic Indicators

- Conduct a comprehensive scientific and engineering computing needs assessment in 2003 that projects these needs through 2013.
- Prepare a high-performance computing prioritized plan within six months of completing the needs assessment.
- Implement the high-performance computing investment plan in 2005 and beyond.

Strategy

Revitalize the telecommunications infrastructure to provide improved access to critical information technology resources.

Telecommunications infrastructure is being enhanced for convergence of communications, networks, computers, wireless infrastructure, and consumer electronics. These technologies enable the way laboratory personnel communicate, work, and interact with each other and partners nationally and internationally.

Advances in telecommunications provide new capabilities, like wireless connectivity and integrated voice and data messaging services necessary for an increasingly mobile work force (see Figure 5). This will greatly hasten complicated work in a manner that reduces rework, limits schedule risks and safety concerns, and trims labor and nonlabor costs.

Strategic Indicators

- Establish and operate a wireless test bed during 2003.
- Establish an advisory team to explore new information technologies in 2004.
- Become recognized as an innovator of telecommunications technology during 2005.
- Complete a network infrastructure upgrade in 2008 to provide a reliable, robust, and secure telecommunications infrastructure.
- Consolidate hardware and software to gain economies of scale and leverage resources.

Figure 5. Using wireless technology, mobile workers are able to collect and analyze information from the field.

Strategy

Provide information technology tools for collaboration with national and international partners.

The success of current and future missions relies on the ability to conduct research, share data, and communicate both locally and globally. We are dedicated to providing technical expertise and resources needed to establish collaborative teams. Information technology being considered for use in our infrastructure is reviewed to ensure it provides or enhances collaborative capabilities.

Strategic Indicators

- Provide a collaboration suite of software and technology to enable local and global partnerships by 2004.
- Enable international teamwork, distance learning, remote data exchange and analysis, real-time data acquisition, and remote experimentation by applying advances in telecommunications and information technology by 2005 (see Figure 7).
- Provide seamless communication services for mobile users by 2006, promoting convergence of information technology communications and services.

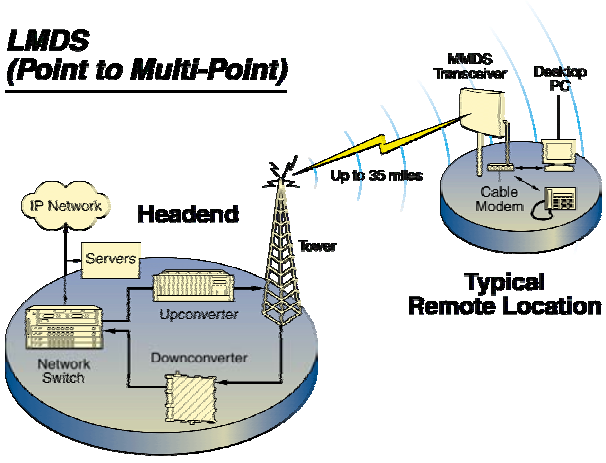


Figure 7. Improved telecommunications capabilities will enhance collaborative ventures at the INEEL.

Strategy

Provide a robust cyber security infrastructure that protects business and technological activities.

INEEL and ICP programs rely extensively on computerized systems and electronic data to support their missions. Security of these systems and data is essential to avoid disruptions in critical operations as well as prevention of data tampering, fraud, or disclosure of sensitive information.

Cyber security is an integral part of the overall site security framework and organizational culture. A pervasive program enables prevention and response to the ever-changing threats faced by a national laboratory. Securing information and systems against a full spectrum of threats requires the use of multiple, overlapping protection approaches, addressing people, technology, and operational aspects of information technology. (see Figure 8).

Strategic Indicators

- Understand and manage security vulnerabilities. Continually reevaluate threats and adapt controls to the changing security environment.
- Integrate security into existing and evolving information technology architecture.
- Prevent malicious and inadvertent cyber security disruptions.
- Deploy technology solutions that provide “defense-in-depth” protection and achieve best-in-class cyber security recognition during 2004.

Figure 8. While the INEEL's computer systems are under attack every day, robust cyber security solutions protect millions of dollars worth of intellectual property.

GOAL 3 - Satisfy customers through responsive services by a cross-organizational pool of skilled professionals

We are dedicated to improving customer satisfaction. To us, customer satisfaction means clearly understanding customer requirements and satisfying them every time. We are putting in place new tools and processes to improve our ability to detect and mitigate technology issues rapidly. Anticipating customer concerns permits us to deal with issues before they become problems.

Strategy

Continually improve services and products, applying the INEEL's customer satisfaction guiding principles.

We are employing best-management practices to continuously improve our performance. These include the Integrated Safety Management System, the Standards-Based Management System, R2A2s, Six Sigma process management improvement tool, our institutional and work planning process, self-assessment program, and our Project Engineering Tool Box. We are committed to continuous improvement through developing highly capable staff, facilities, and equipment.

Strategic Indicators

- Establish formal service-level agreements with projects during 2004.
- Provide information technology services using multiple methods of delivery.
- Report on technology solutions and services that resolve critical program needs.

Strategy

Maintain ongoing communications with scientific, engineering, and operational communities, addressing available and emerging technical capabilities and support.

A continuous exchange of information assists partnerships in furthering missions. We are committed to frequent and ongoing communications with our customers.

Strategic Indicators

- Develop and implement a suite of communication techniques focused on increasing awareness of available information technology products, services, and resources in 2004.
- Publish an information technology service directory in 2004.
- Use business liaisons and technology automation leads to ensure communication and customer satisfaction.

Strategy

Manage computer scientists, computer engineers, and information technology staff to ensure continuing competence.

The success of our laboratory initiatives depends in part on the communications infrastructure, data, and technology tools available to scientists, engineers, and administrators. Of utmost importance is our ability to attract and maintain a talented core of computer scientists and engineers. We are committed to provide skilled professionals who can plan, implement, operate, and utilize the information technology environment of the future.

Strategic Indicators

- Develop a plan for ensuring availability of qualified computer scientists, computer engineers, and information technology professionals; identifying current staff capabilities, assessing future staffing needs, and describing recruitment/hiring strategies, training plans, and retention methods during 2004.

- Develop a matrix of basic and continuing educational requirements for the staff by the end of 2004.

- Manage peak workloads by supplementing the internal work force with subcontract or part-time personnel.

GOAL 4 - Maximize information technology investments

We must respond successfully to the same competitive challenges faced by organizations throughout the world. These challenges include increasing competition for new and existing markets, unprecedented cost and quality competition, an uncertain fiscal environment, a rapidly changing technology base, and turbulent global political and economic conditions. In this dynamic business and technical environment, effective management and use of information technology directly influences the competitive position of any organization. Throughout industry, managers have become increasingly aware of the vital importance of sound information management practices and of the need to maintain an effective link between the company's business strategies and information technologies.

Strategy

Ensure that information technology resources and assets are in place to support and advance INEEL missions.

Strategic Indicators

- Use the established cross-organizational information technology forums to validate investment needs and priorities.

- Provide senior management with an information technology scorecard describing information technology investments in 2004.

- Establish management practices for the information technology portfolio by 2005.

Strategy

Eliminate duplication of data, software, and hardware.

Our objective is to maximize the sharing of data and minimize redundant maintenance and manipulation across the INEEL and ICP. Avoiding duplicate applications or Web forms that create and maintain redundant data is critical to providing more effective use of our scientific, engineering, and business resources.

The availability of technology has driven computing resources to become very distributed, with many small servers and support groups. A key emphasis in minimizing duplication is to pull together computing resources for an efficient, effective, and consolidated information technology environment.

Strategic Indicators

- Expand the data dictionary to include scientific and engineering data sources during 2004.

- Expand enterprise architecture and information technology action plans to encompass additional scientific and engineering information technology investments during 2004.

- Integrate data management into planning, authorizing, and implementing technology projects by 2005.